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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,131	07/25/2001	Shohhei Fujio	JP920000229	2739

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EXAMINER
CHU, CHRIS C

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 06/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/682,131	FUJIO ET AL.	
	Examiner	Art Unit	
	Chris C. Chu	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on March 28, 2003 has been received and entered in the case.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 ~ 3, 5 ~ 8 and 10 ~ 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Egawa in view of Hundt.

Regarding claim 1, Egawa discloses in Fig. 3A and Fig. 3B a semiconductor integrated circuit device comprising:

- a die (12);
- a ground plane (18) connected to the ground lead;

- an electrically insulating layer (100-1) which electrically isolates said die and said ground plane; and
- a decoupling capacitor (19) having a first end and a second end, the first end connected to the ground plane and the second end connected to the power lead; and
- an encapsulating material (13) which encapsulates the die.

Egawa does not disclose a connection, a ground lead and a power lead. However, Hundt teaches in Fig. 3 and Fig. 5 a die (16 in Fig. 5) connected to a ground lead (18f) and a power lead (18e). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Egawa by using the connection, the ground lead and the power lead as taught by Hundt. The ordinary artisan would have been motivated to modify Egawa in the manner described above for at least the purpose of providing electrical connection between an external power supply (column 8, lines 10 ~ 13).

Regarding claim 2, Egawa discloses in Fig. 3A said ground plane being adjacent a first plane of a printed circuit board for mounting electronic parts.

Regarding claim 3, Egawa discloses in Fig. 3A said ground plane (18) extending in two dimensions beyond the edges of said die.

Regarding claim 5, Egawa discloses a power lead (17) being connected to a power supply bonding pad of the die (12) through a bonding wire (8) at the die-side end, and the first end of the decoupling capacitor (19) being connected to the ground plane (18) and the second end of the decoupling capacitor being connected to the specified location of said portion for inserting the power lead. A further difference between Egawa and claimed invention is the portion of the encapsulating material (32) for inserting the power lead. Hundt teaches in Figs. 3 ~ 5 a portion of

an encapsulating material (32) for inserting a power lead (18e). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Egawa by using the encapsulating material to insert the power lead as taught by Hundt. The ordinary artisan would have been motivated to further modify Egawa in the manner described above for at least the purpose of protecting the leads.

Regarding claim 6, Hundt discloses in Figs. 3 ~ 5 the specified location of the portion for inserting the power lead to which the decoupling capacitor is connected is the die-side end of the portion for inserting the power lead.

Regarding claim 7, Hundt discloses in Figs. 3 ~ 5 the ground plane being connected to the die-side end of the portion for inserting the power lead into the encapsulating material.

Regarding claim 8, since Egawa does not limit the encapsulating material to be any particular or specific material, his/her disclosure encompasses all well known materials for the encapsulating material including the layer between the die and the ground plane having a lower dielectric constant than the dielectric constant of the encapsulating material.

Regarding claim 10, Egawa and Hundt discloses an electronic apparatus or control apparatus comprising a semiconductor integrated circuit device according to Claim 1. See reject of claim 1.

Regarding claim 11, Egawa discloses the electrically insulating layer comprising one of air, encapsulating material or bonding material.

Regarding claim 12, a further difference between Egawa and claimed invention is the ground plane comprising a layer of metal. Hundt teaches in column 5, lines 52 ~ 57 a ground plane (90) comprising a layer of metal. Thus, it would have been obvious to one of ordinary skill

in the art at the time when the invention was made to further modify Egawa by using the metal for the ground plane as taught by Hundt. The ordinary artisan would have been motivated to further modify Egawa in the manner described above for at least the purpose of increasing electrical conductivity.

Regarding claim 13, Hundt discloses in column 6, lines 45 ~ 55 the layer of metal comprising copper.

Regarding claim 14, Egawa discloses in Fig. 3A the encapsulating material encapsulating the decoupling capacitor. However, Egawa does not disclose the encapsulating material encapsulating the electrically insulating layer. Hundt teaches in Fig. 5 and column 6, lines 45 ~ 51 an encapsulating material (32) encapsulating an electrically insulating layer (14b). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Egawa by using the encapsulating material to encapsulate the electrically insulating layer as taught by Hundt. The ordinary artisan would have been motivated to further modify Egawa in the manner described above for at least the purpose of protecting the electrically insulating layer.

Regarding claim 15, a further difference between Egawa and claimed invention is the encapsulating material encapsulating the ground plane. Hundt teaches in Fig. 5 an encapsulating material (32) encapsulating a ground plane (90). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Egawa by using the encapsulating material to encapsulate the ground plane as taught by Hundt. The ordinary artisan would have been motivated to further modify Egawa in the manner described above for at least the purpose of protecting the ground plane.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Egawa and Hundt as applied to claims 1 ~ 3 above, and further in view of Hirasawa et al.

Regarding claim 4, Egawa discloses in Fig. 3A an intra-package wiring substrate comprising wirings (9) for a connecting path between the ground and power leads, and the decoupling capacitor (19) being connected to the ground plane at one end and the power line of the intra-package wiring substrate at the other end. However, Egawa does not disclose bonding pads of the die being disposed between the die and the ground plane. Hirasawa et al. discloses in Fig. 4C and column 6, lines 43 ~ 52 bonding pads (409a) of a die (406) being disposed between the die and a ground plane (401a). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Egawa by using the bonding pads of the die being disposed between the die and the ground plane as taught by Hirasawa et al. The ordinary artisan would have been motivated to modify Egawa in the manner described above for at least the purpose of increasing bond strength between the chip and the substrate.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Egawa and Hundt as applied to claim 1 above, and further in view of Hernandez et al.

Egawa and Hundt discloses the claimed invention except for an external decoupling capacitor provided on the printed circuit electrically connected in parallel with the decoupling capacitor of the semiconductor integrated circuit device. However, Hernandez et al. teaches an external decoupling capacitor (60) provided on the printed circuit (68 and see Fig. 10B) electrically connected in parallel with the decoupling capacitor of the semiconductor integrated

circuit device. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Egawa by including an external decoupling capacitor provided on the printed circuit electrically connected in parallel with the decoupling capacitor of the semiconductor integrated circuit device as taught by Hernandez et al. The ordinary artisan would have been motivated to further modify Egawa in the manner described above for at least the purpose of lower decoupling loop (read column 2, lines 68).

Response to Arguments

6. Applicant's argument with respect to claim 1 has been considered but is moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
May 27, 2003

EDDIE LEE
SUPERVISORY PATENT EXAMINER
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